

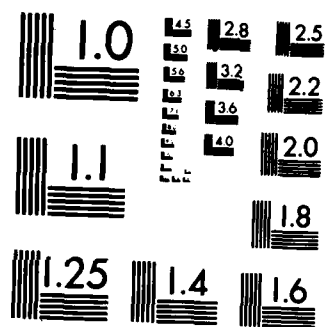
HOSPITALIZATION RATES AMONG SELECTED NAVY ENLISTED  
OCCUPATIONS BY AGE EDU. (U) NAVAL HEALTH RESEARCH  
CENTER SAN DIEGO CA J C HELMKAMP ET AL. AUG 84  
NAVHLTHRSCHC-84-34 F/G 6/2

NL

UNCLASSIFIED

F/G 6/5

[illegible]



AD-A147 578

(2)

**HOSPITALIZATION RATES AMONG SELECTED NAVY ENLISTED  
OCCUPATIONS BY AGE, EDUCATION AND PAY GRADE**

**J. C. HELMKAMP  
C. L. COLCORD**

**REPORT NO. 84-34**

**DTIC  
ELECTE  
NOV 19 1984**  
S B

DTIC FILE COPY



**NAVAL HEALTH RESEARCH CENTER**

P.O. BOX 85122  
SAN DIEGO, CALIFORNIA 92138-9174

**NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND  
BETHESDA, MARYLAND**

**DISTRIBUTION STATEMENT A**

Approved for public release  
Distribution Unlimited

84 11 14 130

HOSPITALIZATION RATES AMONG SELECTED NAVY ENLISTED OCCUPATIONS  
BY AGE, EDUCATION AND PAY GRADE

LCDR James C. Helmkamp, MSC, USN  
and  
Christine L. Colcord, B.A.

Naval Health Research Center  
P.O. Box 85122  
San Diego, California 92138

DTIC  
ELECTE  
NOV 19 1984  
S B D

To expedite communication of our research, this is a preprint of a paper submitted to Public Health Reports and should be cited as a personal communication.

Report 84-34 was supported by the Naval Medical Research and Development Command, (Department of the Navy) Bethesda, Maryland, under research Work Unit MF58.524.001-0007. The views presented in this paper are those of the authors. No endorsement by the Department of the Navy has been given or should be inferred.

Special thanks are extended to Drs. E. K. Eric Gunderson, Frank Garland, and Larry Palinkas for their helpful comments and suggestions.

**DISTRIBUTION STATEMENT A**

**Approved for public release  
Distribution Unlimited**

## SUMMARY

### Problem

Recent epidemiological studies of Navy personnel during the period 1965-1976 revealed that Aviation Boatswain's Mates, Boatswain's Mates, Boiler Technicians and Hospital Corpsmen had hospitalization rates, in several diagnostic categories, significantly higher than the Navy norm. In order to obtain a better understanding of the epidemiology of these diseases, it is necessary to examine basic demographic and service-related factors, that may contribute to these high rates of hospitalization.

### Objective

The objective of this study was to provide more detailed analyses of specific illnesses and injuries as a function of demographic and service-related characteristics such as age, pay grade and level of education.

### Approach

The study included all naval hospital admissions of Caucasian male Navy enlisted personnel in the four high-risk occupational groups (AB, BM, BT, HM) during the six-year period from 1974 through 1979. Age, pay grade, level of education and primary diagnosis were extracted from each patient's merged medical and personnel history file.

Detailed analyses were limited to those diagnostic categories that consistently accounted for the largest proportions of all hospitalizations across the four occupational specialties during the six-year period. Within the selected disease categories, variable-specific (age, pay grade, level of education) hospitalization rates for the four occupational groups were compared to Navy norms.

### Results

Accidents, mental disorders and respiratory diseases accounted for more than 40% of all hospitalizations that occurred within each of the four high-risk groups during the 1974-1979 study period. Comparison of the percent of hospitalization by pay grade and educational level, for each of the occupational groups, and for each of the three diagnostic categories, showed varying patterns in relation to Navy norms. Hospitalization rates generally decreased with increasing age, pay grade and educational level for accidents and respiratory diseases. Rates for mental disorders follow this same general trend across education and pay grade levels, however, age specific rates remain relatively steady across age groups. BTs and ABs show inconsistent age rate trends in comparison with HMs, BMs and the Navy norm.

### Conclusions/Recommendations

The finding that three disease categories accounted for more than 40% of all hospitalizations in each of the four occupational groups suggests that these diseases should be priority targets for prevention and control efforts. Particular attention should be directed towards the younger less educated, non-rated personnel of the four high-risk occupational groups.

The Navy integrated medical history/service history computer files will have widespread utility in occupational studies where there are multiple data sources. Computerized calculation of hospitalization rates from this merged file is more efficient and less prone to error than in the past where rates were calculated by hand from individual data sources.



| Availability Codes |                      |
|--------------------|----------------------|
| Dist               | Avail and/or Special |
| A-1                |                      |

## INTRODUCTION

The Occupational Safety and Health Act of 1970 (Public Law 91-576) required that employers provide safe and healthful work environments for working men and women. The provisions of this act were extended to federal employees by Executive Order 11612 and further clarified and superseded by Executive Orders 11807 and 12196. The Chief of Naval Operations (CNO) has issued many instructions and directives during the past several years which address employee safety and health issues and mandate workplace reporting and monitoring requirements.

The range of the Navy's occupational environments encompass ships and shore facilities, men and women, military and civilian personnel, overseas and continental U.S. bases, battle and garrison conditions, extremes of heat and cold, toxic chemicals and explosives, and exposures to both acute and chronic stressors.

Risks of injury and illness that could result from the wide array of potential hazards present in these environments are many and diverse. The severity of these risks presumably depends, in part, on the particular stressor or combination of stressors that one may be exposed to, the magnitude and length of this exposure, and the susceptibility of the individual. Thus, the Navy Medical Department has a considerable challenge to provide for and maintain a safe and healthful work environment for naval personnel.

This study represents the second phase in a series of investigations of the principal risks to the health of active duty naval personnel. The first phase identified particular naval occupational groups to be at higher risks of morbidity and mortality from specific causes than the Navy norm. Hospital admission rates during an eleven and one-half year period (July 1965 - December 1976) were analyzed to establish Navywide morbidity norms (1).

The major occupations found to have among the highest hospital admission rates for disease were Aviation Boatswain's Mate (AB), Boatswain's Mate (BM), Boiler Technician (BT) and Hospital Corpsmen (HM). Widely differing disease patterns were noted for these and three other occupations (1,2). For example, Hospital Corpsmen had relatively high rates of infectious, mental and respiratory disorders in their first two years of service, whereas Boiler Technicians had relatively high mental disorder and circulatory disease rates during 4-10 years of service. These differing disease profiles suggest possible work environment etiologies. These occupations also were found to have significantly higher accidental-injury rates compared to the Navywide norm (3).

Boatswain's Mates and Boiler Technicians are primarily shipboard occupations, representing an operational environment unique to the Navy and vital to operational readiness at sea. Boatswain's Mates maintain deck equipment and machinery, handle cargo, and operate small boats. Boiler Technicians maintain and repair marine steam boilers, pumps, and associated machinery; they transfer, test, and take inventories of fuel and water. Aviation Boatswain's Mates handle, move, and launch aircraft and operate, maintain, and repair aircraft launch and recovery equipment; they also operate and maintain fuel and lubricating oil transfer systems. Hospital Corpsmen assist medical professionals in providing health care to active duty, dependent, and retired populations. Although a major portion of their duties are performed in hospitals, clinics, and laboratories, corpsmen also serve aboard ship and in the field with the Marine Corps. This

occupation is of special interest because of its wide range of shore and sea-based environments and its great diversity of sub-specialties. Studies have shown that Hospital Corpsmen have an overall illness rate more than double the rate for the whole Navy (1) and greatly increased rates for nearly all diagnostic categories across all pay grades (4).

Military demographic variables, such as age, education level, length-of-service, and pay grade have been shown to have a significant impact on overall hospitalization and accident rates in a number of studies (4-8). Other studies have shown that there are differences in illness incidence rates among racial groups in Navy enlisted personnel (9-10).

The purpose of this study is to provide more detailed analyses of specific illnesses and injuries as a function of demographic and service-related characteristics, namely age, pay grade, and level of education. Epidemiologic comparisons will be made among the four occupational specialties that have been previously shown to have high hospitalization rates in the selected diagnostic categories.

#### METHODS

Hospitalization rates were computed for the four high risk occupational groups (AB, BM, BT, and HM) during the period January 1, 1974 through December 31, 1979. Inpatient records, originally collected by the Navy Medical Data Services Center in Bethesda, Maryland, were edited and compiled into individual medical histories at the Naval Health Research Center. These records included all active duty Navy Caucasian enlisted males hospitalized in naval medical facilities throughout the world during the 1974-1979 period.

Population data, for the total Navy and for the occupational groups under investigation, were compiled from data files obtained from the Manpower and Personnel Management Information System (NMPC 15642). Since this data base contains the records of more than two and one half million enlisted personnel on active duty during the 6-year period, a random sample was taken to derive estimates of average strength per year. A ten percent sample of all enlisted Caucasian males on active duty as of December 31 of each year, from December 31, 1973 to December 31, 1979, was selected. For each study year, the average estimated strength for the beginning of the year (December 31 of the previous year) and the end of the year were multiplied by a factor of 10 (to derive a 100 percent estimate), summed and divided by six to provide an annual total strength estimate. These strength estimates were used to calculate total Navy hospitalization rates, or Navy norms.

For each of the four occupational groups it was necessary to obtain an estimate of annual strength which takes into account fluctuations that occur from one part of a year to another. The estimate of strength for a calendar year was based on the average strength for five quarterly reporting periods (December of the previous year, March, June, September and December). This was considered to be a more accurate estimate than one based on four quarters. Thus, for each of the four groups, population data from NMPC quarterly extracts were summed and divided by the 29 quarters in the study period (manpower data for one quarter in 1977 was not available) to provide an average annual strength.

Variables examined in this study included occupation, age, primary diagnosis, pay grade and education. Diagnoses were in accordance with the eighth revision of the International Classification of Disease Adopted for use in the United States (ICDA-8). Sixteen of eighteen possible diagnostic categories were included in this study.<sup>a</sup> Detailed analyses were limited to those diagnostic categories that consistently accounted for the largest proportions of all hospitalizations.

Hospital admissions, for each diagnostic category, were summed over the study period and divided by six to provide an annual average. Hospitalization rates were expressed as the number of hospital admissions per year per 100,000 men. These rates, variable-specific for age, pay grade and education, were calculated for each of the four high-risk occupational groups and for the total Navy.

The frequency distributions for several of the demographic variables suggested that these variables should be grouped. This would permit more efficient calculation of rates and comparability to the epidemiologic literature. Age, which had a range of 17 to 64 years, was collapsed into seven groups ( $\leq 19$ , 20-22, 23-24, 25-29, 30-34, 35-39, and  $\geq 40$ ). Pay grade was stratified into six groups from E1 to E9 where E1 and E2s form the first group and E7 and above the last group. Levels of educational accomplishment ranged from grammar school to graduate studies. Education categories were combined into three groups representing those who had not completed high school, high school graduates, and those with education beyond high school. If a level of variable contained less than 2.0% of the population within an occupational group, then hospitalization rates were not calculated.

#### RESULTS

Results of this study will be presented in terms of: comparisons of means for selected demographic variables among the four occupational groups; comparisons of the percentage distributions for hospitalizations in selected diagnostic categories; age-specific hospitalization rates for selected diagnostic categories by occupation, and pay grade and education specific hospitalization rates for selected diagnostic categories by occupation.

##### Comparisons of Demographic Variables on Means and Percentage Distributions

Table 1 presents comparisons of means for age, education and pay grade among the four occupational specialties. Aviation Boatswain's Mates are the youngest group (23.0 years) and Boatswain's Mates the oldest (26.0 years). This same trend also is apparent across the four occupations for pay grade; ABs have the lowest pay grade (3.4) and BMs the highest pay grade (4.2). This pattern is not present for education, however, where ABs, BMs and BTs have, on the average, somewhat less than a high school education and HMs tend to be high school graduates with

---

<sup>a</sup>The two omitted categories--complications of pregnancy, child birth and the puerperium, and certain causes of perinatal morbidity and mortality--were not applicable to the study.



some college. Analysis of variance (ANOVA) indicates that there are statistically significant differences ( $p < .001$ ) among the occupational group means for each demographic variable.

Table 2 compares the percentage distributions among the four occupations across the sixteen ICDA-8 diagnostic categories that were applicable to these male populations. Accidents and injuries (both on and off duty) accounted for the highest percentage of hospitalizations in all four occupations as well as in the Navywide population. Mental disorders, which include alcohol and drug related problems, consistently accounted for the second highest proportion of hospitalization in three of four of the occupational specialties. The third and fourth highest were evenly split between digestive and respiratory diseases. However, in the Navywide population respiratory diseases accounted for the third highest proportion of total hospitalizations over the six-year period. Thus, for the remainder of this section, comments are limited to the following three diagnostic categories; accident and injuries, mental disorders and respiratory diseases.

#### Age-specific Hospitalization Rates

Figures 1 through 3 show age-specific hospitalization rates for the four occupational groups in each of the three major disease categories. Figure 1 shows that Navywide hospitalizations for mental disorders decrease through age 24, remain stable through age 34, and increase slightly in later years. Only the pattern for BMS closely approximates this U-shape, however. The trends for other specific occupations are quite different. The ABS showed a decline in admission rate at age 20-22 but substantial increases through age 29 and again at age 40 and over. Generally, ABS had the lowest relative risk of mental disorders compared to the Navy norm. BTs similarly showed a sharp decrease in rate at age 20-22 and a precipitous rise at age 25-29. BMS paralleled the Navy norm and had a relative risk almost double that of the Navy normative group at all age groups 20-22 and above. HMS showed a sharp decline in admission rate at age 20-22 but a substantial increase again at 35-39. HMS were the only group in which the rate declined substantially in the oldest age group.

Figure 2 shows that risks of accidents and injuries are substantially greater at all age levels in these four selected occupations than in the Navy generally. Relative risks of serious injury are much greater among younger, less experienced members of those occupations.

Figure 3 shows that Navywide hospitalizations for respiratory diseases drop sharply from age 19 or less to age 20-22, continue to decline through age 30-34 and then rise slightly in older groups. Respiratory disease admission rates for the four specific occupational groups generally parallel these curves but with some variation. HMS are at greatest risk for respiratory diseases at all age levels except 19 and below and 35-39 when ABS and BTs, respectively, are at higher risk. Younger BMS (age 20-22) appear to be more susceptible to respiratory diseases, while older BMS approximate the Navy norm. Younger BTs (age 19 or less) have high respiratory disease rates, but middle range BTs (ages 20-29) show little deviation from the norm; older BTs (ages 30-39) again show elevations in relative risk. ABS show only small deviations from the Navy norm for ages 20-39.

## Pay Grade and Education-specific Hospitalization Rates

Figures 4 through 6 present hospitalization rates for major diseases by occupation and pay grade. Similarly, Figures 7 through 9 present rates by occupation and level of education. The patterns for pay grade in Figure 4 are more consistent and regular than the corresponding patterns for age in Figure 1. The Navy norm shows a sharp decline in the mental disorder hospitalization rate to the E5 level, and a stable rate at E6 and E7-E9. The rate for ABs closely parallels the Navy norm. The rate for BTs shows a sharp drop through E4, then substantial rises at E5 and E7-E9. The rate for BMs is relatively high at E4 and E5 then declines slightly through E7-E9. The rate for HMs is extremely high for non-rated personnel (pay grades E1-E3), and remains high for petty officers (E4-E7).

The Navy norm for accident and injury hospitalizations (Figure 5) shows an initially high level at the lowest pay grades (E1-E3), sharp reductions over paygrades E4 and E5, and further slight reductions over the remaining pay grades. Rates for the four specific occupations start at much higher levels and, except for HMs, show sharp linear reductions through E7-E9. It is notable that the accident rate for ABs and BTs peak at E3 which generally coincides with first sea duty. BTs and BMs remain at highest risk through E6.

Figure 6 shows that Navywide respiratory disease admission rates drop sharply from pay grades E1-E2 to E3, decline sharply through E6 and risk slightly at E7-E9. The four occupational groups follow similar patterns but with notable variations. BTs show a very large decline from pay grades E1-E3 to E5 but then an increased relative risk for first class petty officers (E6) and then a slight decrease in risk for senior petty officers (E7-E9). BMs and ABs generally parallel the Navy norm. HMs are at relatively high risk in lower pay grades (E3-E5) but follow the Navy norm in the higher pay grades (E6-E9).

Figure 7 shows that the relationship between education level and hospitalization rate for mental disorders was essentially the same for the Navy normative group and the four specific occupational groups, that is, a higher rate for non-high school graduates and lower but slightly different rates between high school graduates and those with some college. There are, however, notable differences; ABs, BMs and BTs had higher rates for both the non-graduate and college groups compared to high school graduates. HMs showed an extremely high admission rate for mental disorders among non-high school graduates.

Hospitalization rates for accidents by occupation and educational level are shown in Figure 8. For HMs, BTs, and the Navy normative group, the relationship between education and accident rate was essentially linear--low education was associated with high accident rates, high school graduates had lower rates than men with some college education.

For respiratory disease (Figure 9), hospitalization rates for HMs and BTs paralleled that for the normative Navy group--the rate for the non-high school graduates was substantially higher than the rates for high school graduates or college educated men. For ABs and BMs, both non-graduates and college educated groups had higher admission rates than the high school graduates.

#### DISCUSSION

Results indicated that three of the sixteen ICDA-8 diagnostic categories under consideration--accidents, mental disorders, and respiratory diseases--consistently accounted for more than 40% of the hospitalizations that occurred within each of the high risk occupational groups during the six year study period: Aviation Boatswain's Mates (43.7%), Boatswain's Mates (45.6%), Boiler Technicians (48.2%), and Hospital Corpsmen (41.8%).

Further analysis of the 1974-1979 hospitalization data for accidents, mental disorders, and respiratory diseases revealed age, pay grade, and educational level rate differences across the specific occupations. Although on and off duty status was not explored in this investigation, the long term decreasing trends observed for age and pay grade specific accident hospitalization rates, in the total Navy and among each of the occupational groups, agreed with the findings of Ferguson, et al (3) who noted an inverse linear relationship between on and off duty accident rates by level of seniority.

In a later study (8), Ferguson and his colleagues showed that years of education was inversely related to injury rates in the Navy; men with less than a high school education had double the injury rate of men with more than a high school education. This relationship remained consistent when high school graduate and non-high school graduate subgroups were compared for various combinations of mental group (classification of mental ability based on General Classification Test score) and age at enlistment. Our data indicated a similar educational relationship for accident related hospitalizations in the total Navy. Within the occupational groups, however, the degree of difference in rates between educational levels is not as great.

Injury and accident related hospitalization rates, among the four high-risk groups, that are generally two or more times the Navy norms for the youngest, non-rated personnel suggest that a common set of factors may be operating across these occupational specialties. The physical work environment and the inherent nature of the occupations themselves may play a fundamental role in risk of injury, especially for ABs, BMs and BTs whose jobs are typically more physically demanding than those of HMS (3,15). The high rates observed for corpsmen, however, may be a reflection of varied work environments as well as the greater availability of and proximity to medical care compared to the other occupations.

The precipitous drop in occupation specific injury hospitalization rates among age and pay grade levels may be explained, in part, by the fact that personnel who contributed to high rates in the youngest, non-rated groups may not have been around (left Navy after completed tour, otherwise administratively separated) to become a risk for accident or injury at the older, more senior levels. Another point to consider is that as one increases in seniority, the jobs they perform are likely to be less labor intensive compared to the jobs performed by the younger, less experienced sailor and thus present a decreased risk of injury.

Kolb and Gunderson (11) found that a cohort of males who enlisted in the Navy in 1970 and 1971 (mean age 18.8 years) and classified as alcohol abusers had hospitalization rates for accidents and injuries nearly twice that of a comparable control group (mean age 19.0 years) over

a seven-year period. This finding parallels and underscores the frequent association between alcohol abuse and accident-injuries noted in the literature (12-14).

The general factors, discussed above, coupled with personnel characteristics such as immaturity, low educational achievement, and lack of job experience may contribute to the development of risk-taking attitudes, which Ferguson, et al (3) suggest are manifested both on the job and off duty. It follows then, that attitudes exhibited off duty (where over 70% of accident related hospitalizations occur) might also be exhibited on the job and detrimentally affect an individual's job performance and consequently increase the risk of accident or injury.

While this study was in progress it was recognized that duty station assignment at the time of injury might prove to be a potentially useful variable; however, this kind of data was not currently available. Analysis of the work setting in relation to risk of accidental injury might answer such questions as to whether or not certain types of duty stations (ship types, ashore vs at sea, etc) have higher rates of injury hospitalization and death.

The high rate of respiratory disease hospitalization in the youngest age group ( $\leq 19$ ) and lowest pay grades (E1-E2) across all occupational groups may be a natural consequence of men being brought together in the close living quarters of recruit training, school assignments, and shipboard living from diverse geographical locations. The rates generally decrease through age 34 and then increase through age 40. This pattern may reflect an increasing susceptibility of an older population to respiratory problems such as influenza and the common cold, for example, where factors such as diet, physical activity, and life and career stresses may increase one's risk to the debilitating effects often associated with these maladies. This rate trend suggests that an individual's immune system may vary with age and, perhaps, susceptibility is related to genetic as well as environmental influences.

Pay grade and occupation specific hospitalization rates for mental disorders (and for respiratory diseases) follow a similar linear trend that was noted for accidents. The former rates, however, have a tendency to level off in the senior pay grades (E5-E9) and not continue to decrease.

The rates for accident and respiratory disease related hospitalizations across pay grade and age levels supports the positive correlation often observed between pay grade and age. That is, when the rate is either high or low within a given age group one would expect a similar rate in a commensurate pay grade. This relationship is not present in the age and pay grade specific rates for mental disorders, especially for BMs and, to a lesser extent, HMs. The rates for BMs are incongruent at the E3 and 20-22 year age level. Perhaps there are unique occupational and behavioral stresses that manifest themselves at different ages and career stages. Kolb and Gunderson (11) observed high rates of mental disorders, including symptoms of anxiety and depression, among a group of male, first enlistment alcohol abusers followed over a period of seven years. A more detailed analysis of alcohol-related factors might help explain some of the variation observed in the mental disorder hospital admission rates.

The results of this investigation represent the successful merging of two large, divergent data files into a common data base from which overall and variable-specific hospitalization rates

can be easily and automatically computed. The likelihood of error and the amount of time necessary for the calculation of rates was therefore substantially reduced.

The use of an integrated data base will have widespread application in studies of occupational exposure where data from multiple sources are necessary to accurately assess the health risk to workers.

#### REFERENCES

1. Gunderson, E.K.E., Colcord, C. Health Risks in Naval Occupations: An Overview. Report No. 82-1, Naval Health Research Center, San Diego, CA 1982.
2. Richardson, J.W. Assessment of Non-auditory Physiological Effects of Naval Shipboard Fireroom Noise on Naval Personnel. Master's Thesis (unpublished). Department of Health and Safety Studies, California State University at Los Angeles, 1975.
3. Ferguson, J.C., McNally, M.S., Booth, R.F. Accidental Injuries Among Naval Personnel by Occupation, Duty Status, and Pay Grade. Report No. 81-7, Naval Health Research Center, San Diego, CA 1981.
4. Holberg, A. Sex and Occupational Differences in Hospitalization Rates Among Navy Enlisted Personnel. JOM 22:685-690, 1980.
5. Gunderson, E.K.E., Rahe, R.H., Arthur, R.J. The Epidemiology of Illness in Naval Environments, II. Demographic, Social Background, and Occupational Factors. Military Medicine, 453-458, June 1970.
6. Plag, J.A., Phelan, J.D. The Epidemiology of Illness Among First-term Naval Enlistees, I. Incidence by Type of Illness and Length of Service. Am J Epidemiol 92(1):1-12, 1970.
7. Pugh, W.M., Gunderson, E.K.E. Individual and Situational Predictors of Illness. Report No. 75-20, Naval Health Research Center, San Diego, CA 1975.
8. Ferguson, J.C., McNally, M.S., Booth, R.F. Individual Characteristics as Predictors of Accidental Injuries in Naval Personnel. Report No. 83-10, Naval Health Research Center, San Diego, CA 1983.
9. Holberg, A., Berard, S.P., Ernst, J. Racial Differences in Hospitalization Rates Among Navy Enlisted Men. Public Health Rep 96(2):121-127, 1981.
10. Palinkas, L., Colcord, C. Health Risks Among Enlisted Males in the U.S. Navy: Race and Ethnicity as Correlates to Hospital Admissions. Report No. 83-31, Naval Health Research Center, San Diego, CA 1983.
11. Kolb, D., Gunderson, E.K.E. A Longitudinal Study of Health Risks Associated with Alcohol Abuse in Young Navy Men. Drug and Alcohol Dependence, 8:131-141, 1981.
12. Kittenhouse, J. (ed). Consequences of Alcohol and Marijuana Use. DHEW Pub. No. (ADM) 80-290, Washington, DC, pp. 139-151, 1979.

13. Messner, H. Accidents as a Symptom of Alcohol Abuse. J Fam Pract 8:1143-1146, 1979.
14. Seixas, F.A. The Medical Complications of Alcoholism. In: S.E. Gitlow and H.S. Peyser (eds), Alcoholism: A Practical Treatment Guide. Grune and Stratton, New York, pp. 165-180, 1980.
15. Bureau of Naval Personnel. United States Navy Occupational Handbook. Sixth Edition, Washington, D.C., 1971.

Table 1  
Comparisons of Means for Selected Demographic  
Variables by Occupation for CY 1974-79 Combined

| Rate  | N    | Age<br>(yrs)               | Education<br>(yrs) | Pay Grade    |
|-------|------|----------------------------|--------------------|--------------|
| AB    | 731  | 23.0<br>(5.9) <sup>a</sup> | 11.5<br>(1.1)      | 3.4<br>(1.7) |
| BM    | 1216 | 26.0<br>(7.4)              | 11.4<br>(1.2)      | 4.2<br>(1.8) |
| BT    | 1405 | 23.4<br>(6.3)              | 11.4<br>(1.0)      | 3.5<br>(1.8) |
| HM    | 2980 | 24.3<br>(6.1)              | 12.2<br>(1.0)      | 3.7<br>(1.6) |
| ANOVA |      | p < .001                   | p < .001           | p < .001     |

<sup>a</sup>Standard Deviation

Table 2  
Percentage Distributions by Diagnostic Category and Occupation

| Diagnostic<br>Category<br>(ICDA-8) | Occupational Rate |         |         |         | Navy<br>Norm |
|------------------------------------|-------------------|---------|---------|---------|--------------|
|                                    | AB                | BM      | BT      | HM      |              |
|                                    | %                 | %       | %       | %       | %            |
| Infection                          | 8.7               | 6.3     | 8.0     | 11.2    | 8.3          |
| Neoplasm                           | 1.4               | 1.6     | 1.4     | 1.7     | 1.6          |
| Endocrine                          | 0.6               | 0.5     | 0.4     | 0.6     | 0.7          |
| Blood                              | 0.2               | 0.2     | 0.2     | 0.3     | 0.3          |
| Mental Disorder                    | 9.9               | 13.8**  | 14.3**  | 14.2**  | 14.5**       |
| Nervous System                     | 2.4               | 3.4     | 3.4     | 2.6     | 2.9          |
| Circulatory                        | 2.5               | 4.2     | 2.8     | 3.3     | 3.1          |
| Respiratory                        | 10.9**            | 9.7     | 10.9*** | 12.8*** | 11.2***      |
| Digestive                          | 10.0***           | 10.3*** | 8.9     | 11.5    | 9.8          |
| Genitourinary                      | 5.6               | 5.1     | 3.2     | 4.6     | 4.2          |
| Skin Disease                       | 7.8               | 6.3     | 7.0     | 4.9     | 6.4          |
| Musculoskeletal                    | 8.2               | 8.9     | 9.3     | 9.0     | 8.7          |
| Congenital                         | 0.7               | 1.2     | 1.0     | 1.5     | 1.2          |
| Symptoms                           | 4.8               | 4.1     | 3.6     | 4.5     | 4.3          |
| Accidents                          | 22.8*             | 22.1*   | 23.0*   | 14.8*   | 19.7*        |
| Supplementary                      | 3.5               | 2.3     | 2.6     | 2.5     | 3.1          |
| Totals                             | 100.0             | 100.0   | 100.0   | 100.0   | 100.0        |

\*Highest % of total hospitalizations

\*\*Second highest % of total hospitalizations

\*\*\*Third highest % of total hospitalizations

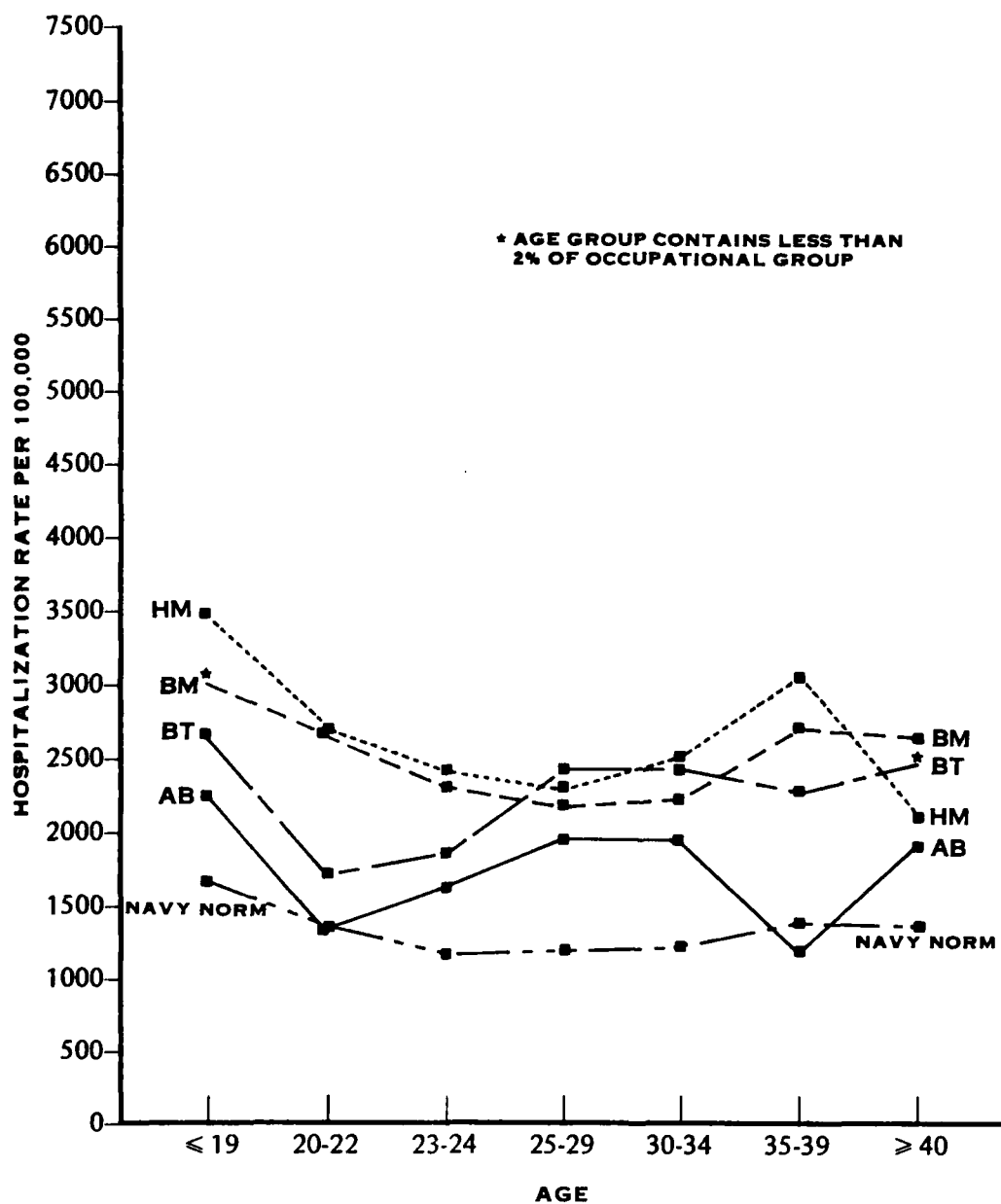


Figure 1. Hospitalization rates for mental disorders by occupational group and age, 1974-79.

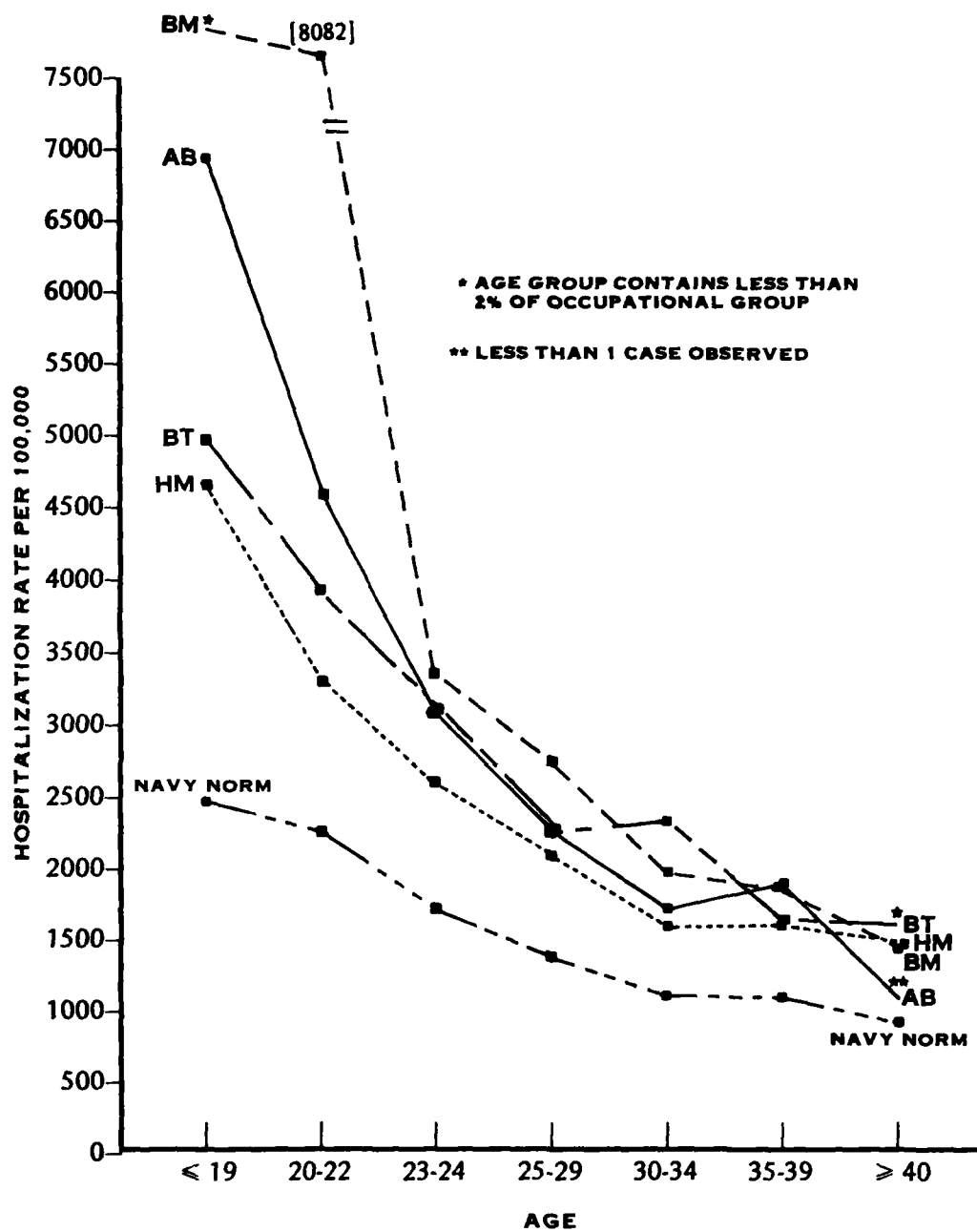


Figure 2. Hospitalization rates for accidents by occupational group and age, 1974-79.



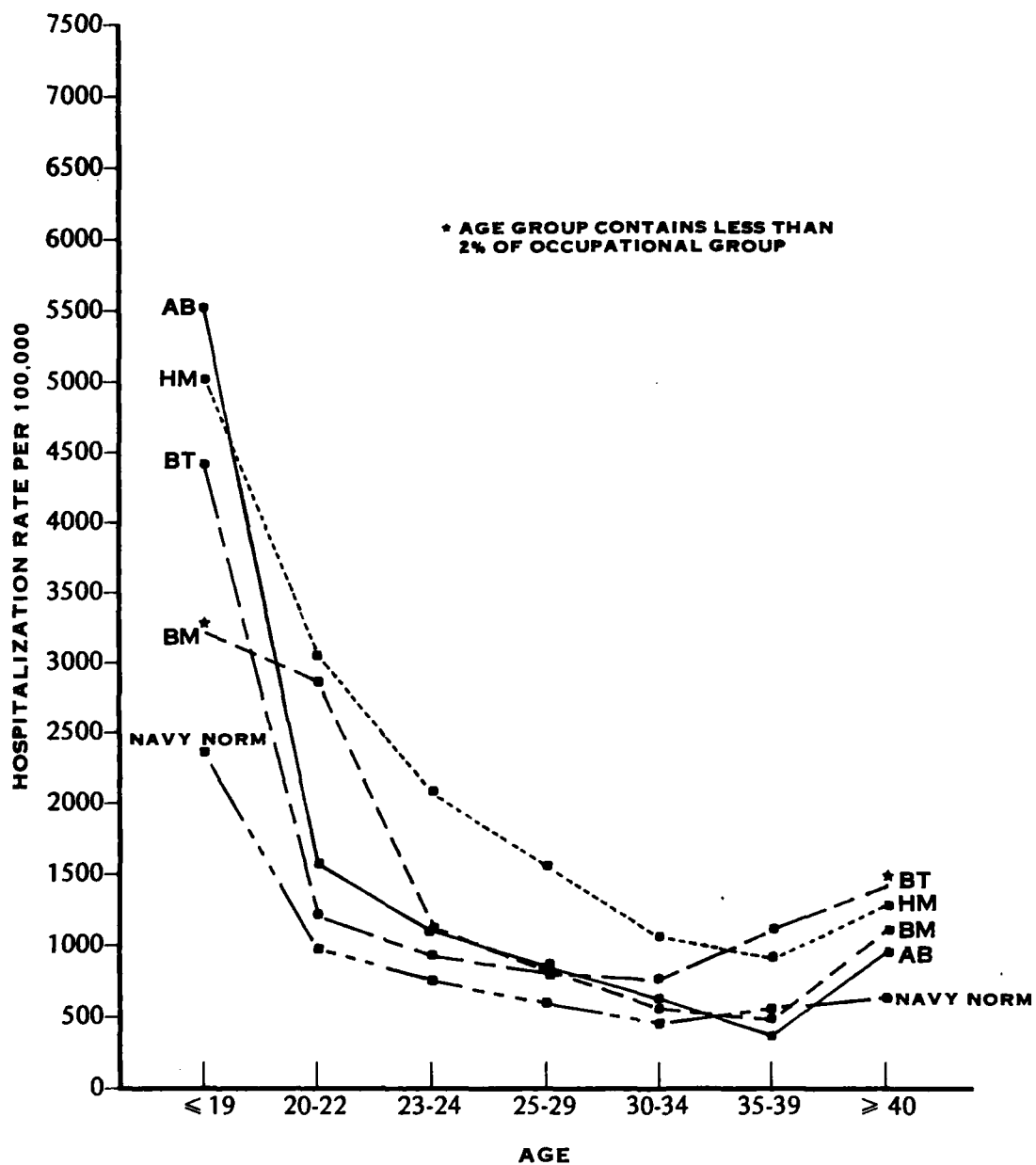


Figure 3. Hospitalization rates for respiratory diseases by occupational group and age, 1974-79.

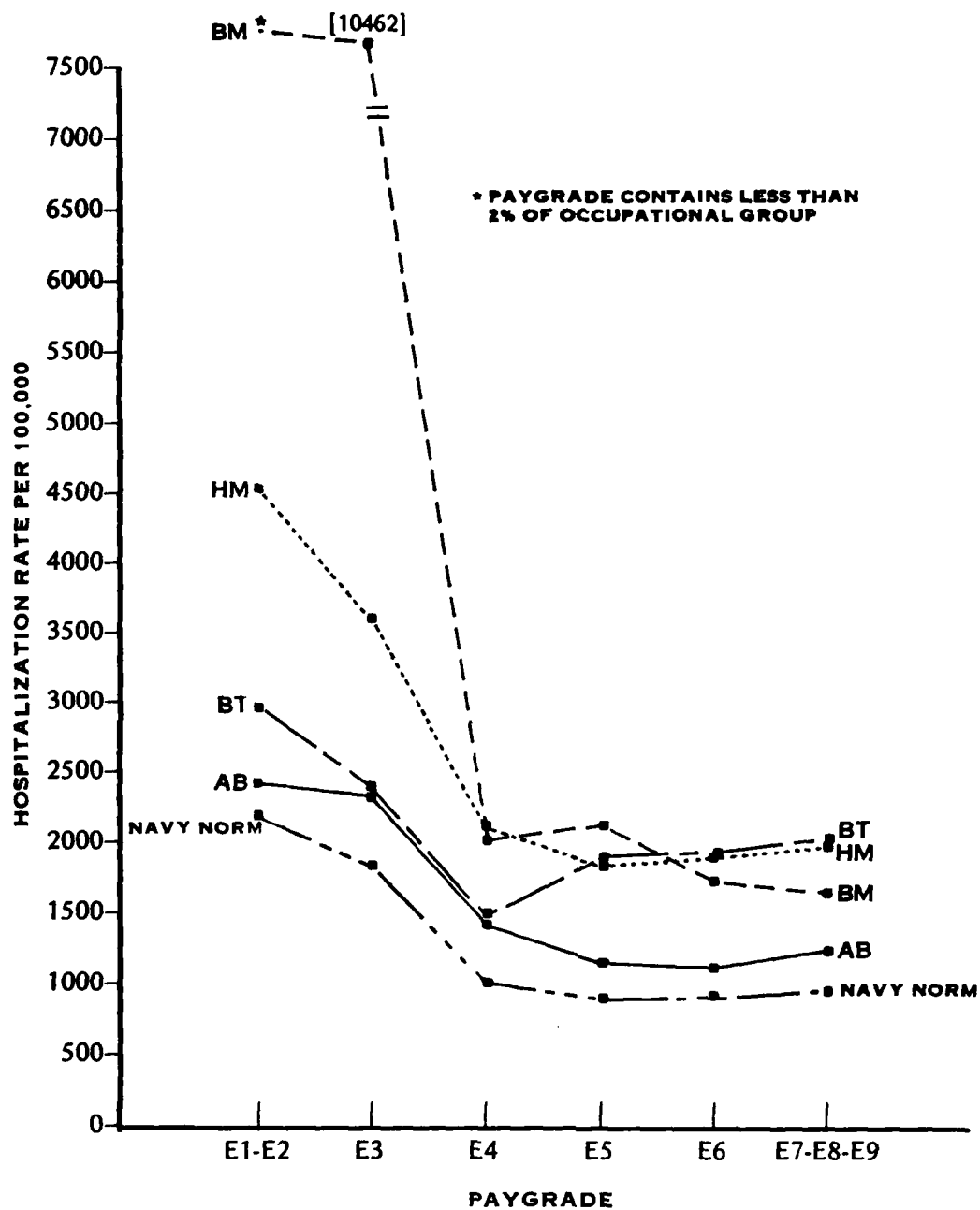


Figure 4. Hospitalization rates for mental disorders by occupational group and paygrade, 1974-79.

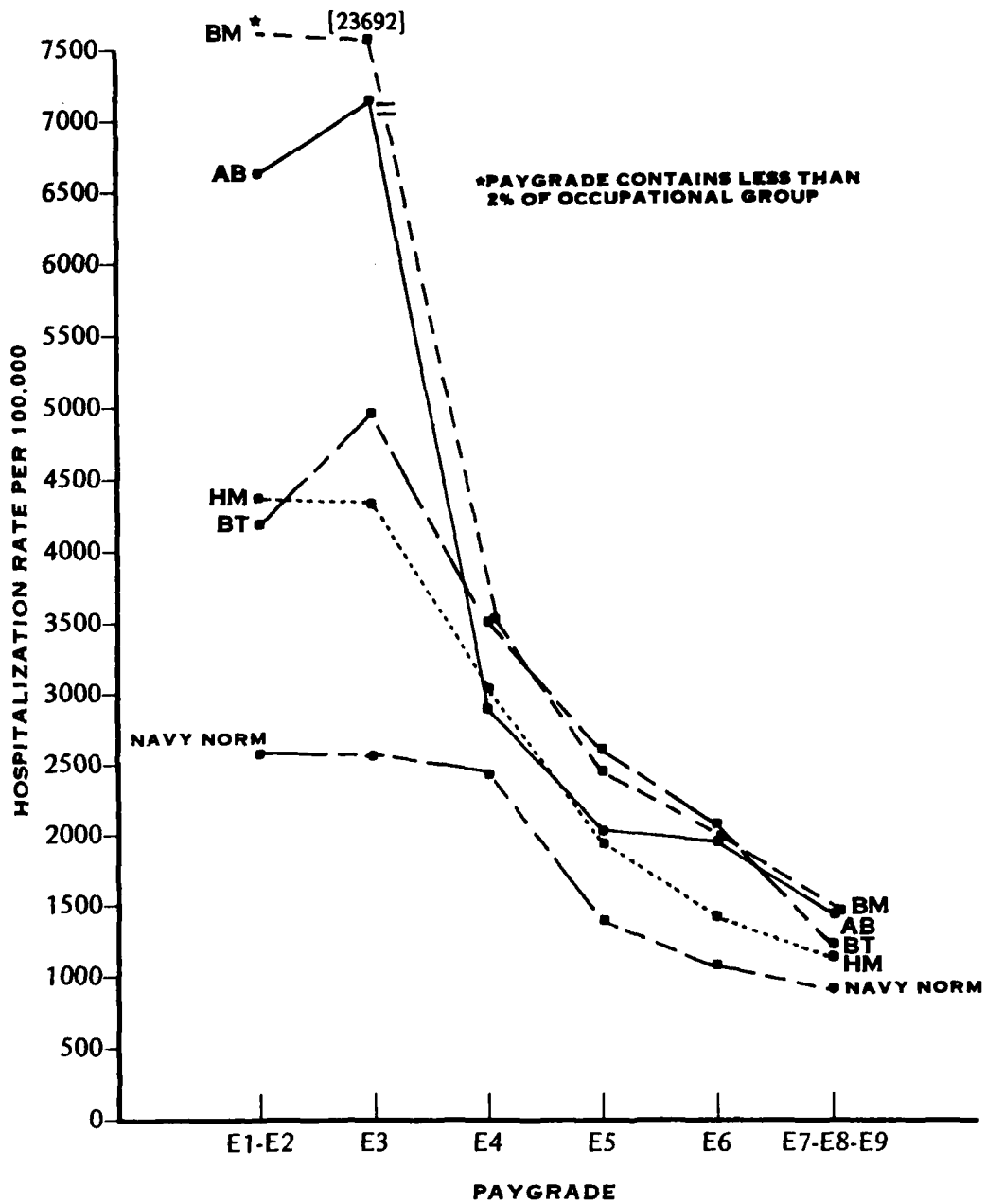


Figure 5. Hospitalization rates for accidents by occupational group and paygrade, 1974-79.

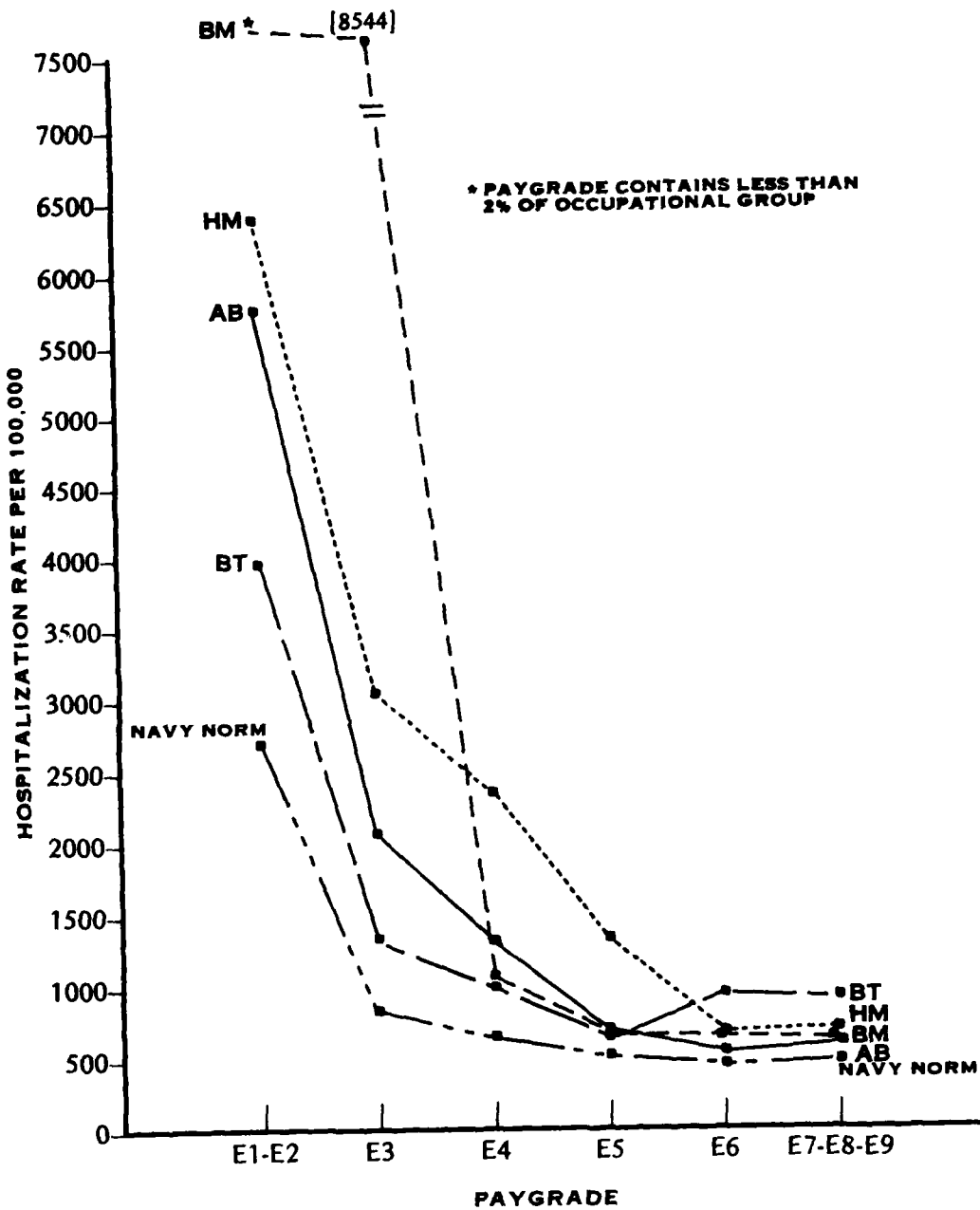


Figure 6. Hospitalization rates for respiratory diseases by occupational group and paygrade, 1974-79.

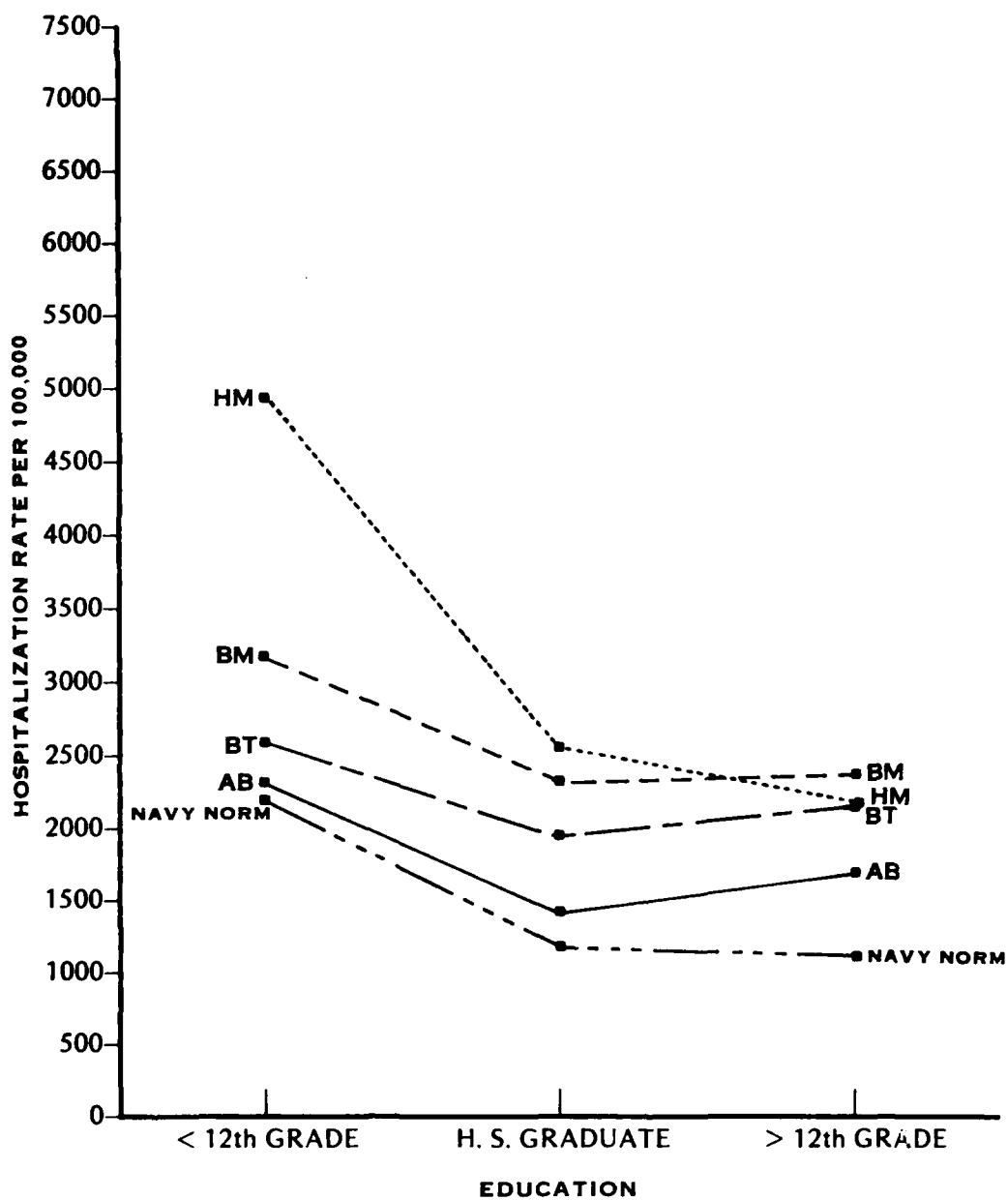


Figure 7. Hospitalization rates for mental disorders by occupational group and education, 1974-79.

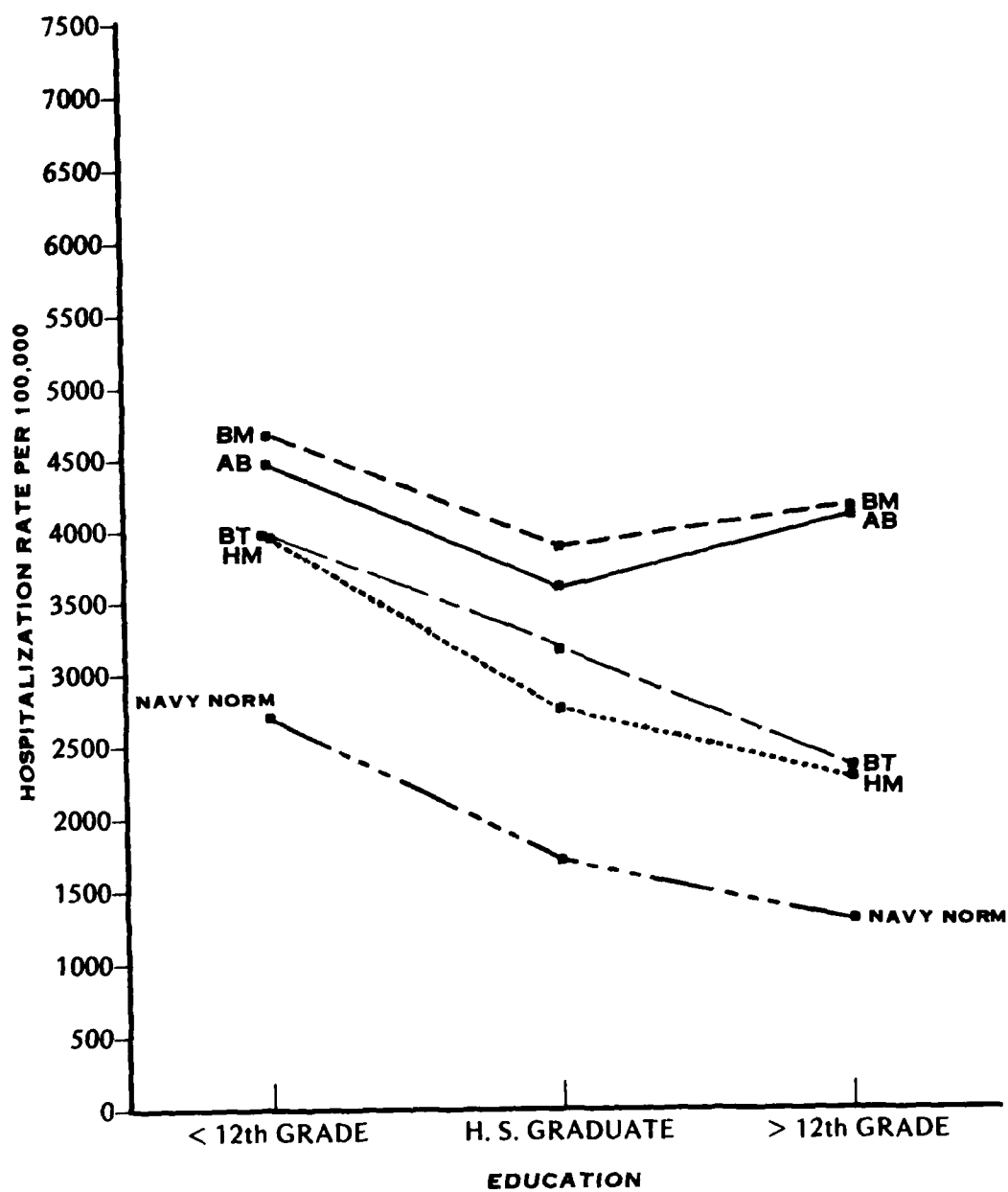


Figure 8. Hospitalization rates for accidents by occupational group and education, 1974-79.

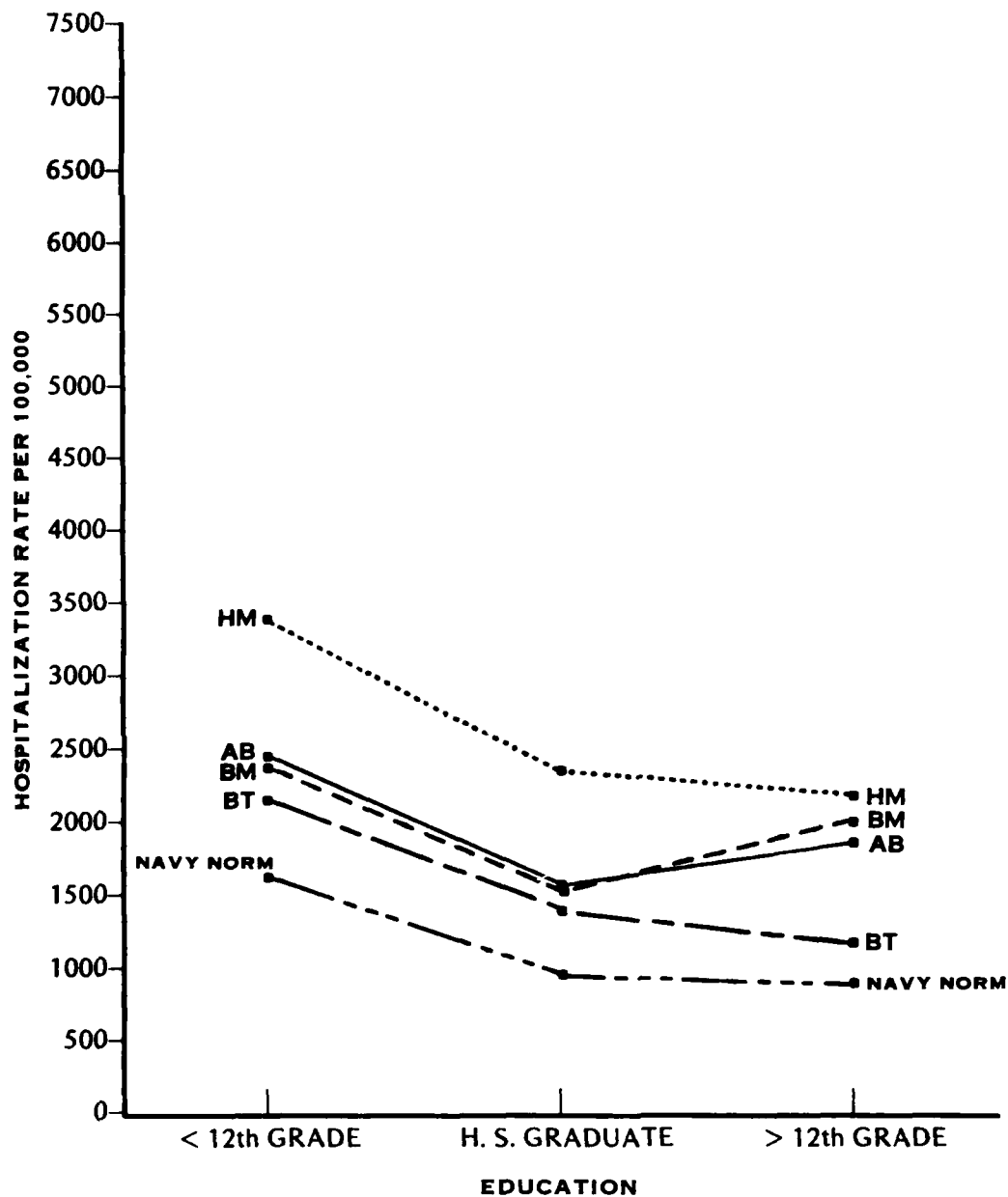


Figure 9. Hospitalization rates for respiratory diseases by occupational group and education, 1974-79.





UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

and respiratory diseases. Rates for mental disorders follow this same general trend across education and pay grade levels, however, age specific rates remain relatively steady across age groups. BTs and ABs show inconsistent age rate trends in comparison with HMs, BMs and the Navy norm.

These diagnostic groups should be priority targets for prevention and control efforts. Particular attention should be directed towards the younger, less educated and non-rated personnel of the four high-risk occupational groups. Use of the Navy integrated medical history/service history computer files will have widespread application in occupational studies where there are multiple data sources.

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

END

UNLIMITED

2-30-41

DTIC